DER Integration and Compensation Initiative 2023-24

Aggregated DERs valuation webinar notes

December 2023

Context

On December 18, 2023, NARUC and NASEO hosted the second webinar of the 2023-24 DER Integration and Compensation initiative, covering aggregated DER (ADER) valuation approaches, trade-offs, case studies and emerging practices.

In lieu of a full recording of the webinar, these notes provide key findings and takeaways from the presentations and discussions, and accompany the slides presented.

Speakers:

- Moderator: **Commissioner Andrew McAllister,** California Energy Commission
- Expert: **Samir Succar,** Senior Director of Energy Markets & Planning, ICF
- Panelist: **Natalie Mims Frick,** Energy Policy Researcher in Energy Markets and Policy Department, Lawrence Berkeley National Laboratory
- Panelist: **Sandra Sweet,** New York Department of Public Service

Moderator Opening Remarks: Commissioner Andrew McAllister, California Energy Commission

Commissioner McAllister opened the session highlighting and enumerating three critical priorities for the energy system today: **Reliability,** including the requirement to ensure suitable planning processes are in place to support reliability; **Decarbonization,** including managing new clean energy assets joining the electric grid, and; **Load growth,** including management of an expanding energy system to support the electrification of transportation, heating and cooling, and industrial and agricultural load. The investments being made on the grid and by customers need to be leveraged to support "native flexibility" and to enable a fully flexible modern energy grid. California has a goal for 67GW of load flexibility by 2030, and the state is using the Market Informed Demand Automation Server (MIDAS) program to create digital tools to support the automation of processes and the sharing of relevant electric grid data to the public. Still, a "conductor is required to ensure the orchestra" of ADER grid services are operated efficiently and economically.

Presentation: Samir Succar, Senior Director of Energy Markets & Planning, ICF

Summary

Samir Succar presented on the complex and dynamic nature of grid services, and how ADERs can provide these services. The presentation distinguished between system value and customer value, focusing on the former, to inform the frameworks for assessing how ADERs can support high load and high renewables penetration energy systems.

Key messages

Value can be localized, variable, uncertain, expanding, and evolving
A large number of variables affect the true value of ADER grid services. Uncovering the full value of ADERs requires a detailed analysis of electric grid needs and benefits provided by ADERs.

There are emerging common frameworks for valuing ADER grid services
There has been progress in the evolution of frameworks for assessing the value of ADERs, including the National Standard Practice Manual for DERs, amongst others (slide 13).

Energy and Ancillary Services might not provide the most value to ADERs
Although there is a lot of focus on energy and ancillary services, in some cases grid services like bulk power system resource adequacy and distribution load serving capacity from ADER can provide more value to the system. This will vary by factors such as market, region, state, system design and market conditions.

Integrated Distribution System Planning (IDSP)
IDSP provides a valuable framework for establishing the goals and outcomes that will define the value streams and grid services most relevant for ADER.

Grid needs are dynamic; services should be based on physical needs that evolve
In the context of identifying the grid services that ADER can provide, it is important to note that the system itself is evolving as a result of the changing composition of the system due to trends that include, but are not limited to DER growth. This means that grid needs continue to evolve and therefore the design of services to meet those needs should be similarly dynamic.

Grid service valuation should include both the alignment of ADERs with the grid needs and the revenue certainty for ADER managers
When considering which grid services to value, regulators, State Energy Officials and utilities should consider both the ability of ADERs to meet the grid need, and whether the enabling infrastructure (technologies, program design, etc.) is designed to enable ADER deployment when needed. Where there is potential for large-scale value creation, this requires scalable solutions that mitigate the complexity and risk associated with grid value so that the services provided can be economically sustainable for ADERs to provide them. Otherwise, the value that DER can provide to the grid and to customers will not be realized.

Resources

National Standard Practice Manual - NESP
Quantifying DER Impacts - NESP
Modern Distribution Grid Guidebook, Volume 4, June 2020
Opportunities to Improve Analytical Capabilities towards Comprehensive Electricity System Planning, NARUC-NASEO Working Paper
Survey of state planning objectives, Schwartz, Berkeley Lab
Opportunities to Improve Analytical Capabilities towards Comprehensive Electricity System Planning, NARUC-NASEO Working Paper
ESIG "Redefining Resource Adequacy for Modern Power Systems"
Source: Navigating the complexity and challenges of non-wires solutions (ICF)

Presentation: Natalie Mims Frick, Energy Policy Researcher in Energy Markets and Policy Department, Lawrence Berkeley National Laboratory (LBNL)

Summary

Natalie Mims Frick's presentation focused on DER aggregation tariff design, informed by LBNL technical assistance requested by the Arizona Corporation Commission (ACC, the utility regulator). LBNL assisted the ACC in its review of Arizona Public Service's (APS) proposed Distributed Demand-Side Resource (DDSR) Aggregation tariff. The ACC required the utility to file a tariff to provide compensation for multiple values provided by DDSR aggregation, including capacity, demand reduction, load shifting, locational value, voltage support, and ancillary and grid services. As part of the tariff development, APS issued a request for proposals (RFP) for three grid service products: system capacity and energy, locational value, and ancillary services. Objectives of the RFP included informing APS's tariff design and selecting a vendor to provide the requested grid services. Natalie Mims Frick outlined key lessons learned through APS's RFP and reviewed RFP responses and APS's proposed tariff, which was ultimately not approved by the ACC.

Key messages

Lessons learned through RFP process design challenges
The cost of submitting a bid proposal was set at $10,000, which may have been prohibitively high for some potential vendors. Many utilities do not require any proposal fees for RFPs seeking demand-side resources, as the effort required to submit a responsive bid is barrier enough to eliminate non-serious respondents. In its most recently filed All Source RFP, APS lowered the application fee to $5,000 for bids smaller than 25 MW.

APS selected the winning bidder in part because it offered proposals for all three products. This preference for a single aggregator may have been a shortcoming in the process. Firms that can site and install DDSR to provide capacity for seasonal peak capacity needs may not have expertise to provide ancillary and grid services. And firms that specialize in providing certain types of services may offer lower prices for them.

The selected aggregator had limited experience in Arizona and little depth of customer engagement in the state. This lack of deep local knowledge meant that they were less successful in securing participating DERs than had been hoped.

The DDSR Aggregation pilot overlapped with APS's existing programs, specifically a residential battery storage pilot. APS could have focused its RFP on DDSR aggregations that tested a combination of resources, instead of duplicating an existing program offering.

Cost-benefit analysis issues
Berkeley Lab's review of APS's cost-benefit analysis found undercounted and excluded benefits. For example, the review found that using a 10-year battery life, instead of APS's proposed program term (5 years), would make most capacity bids cost-effective. A more conventional de-rating of energy and capacity benefits would make most locational value bids cost-effective. Similarly, APS did not select feeders that were congested, resulting in a locational value of zero. Further, if reliability and resilience were considered in the cost-benefit analysis, many customers would be expected to benefit financially.

APS discontinued the DDSR pilot program with the RFP selected aggregator when their largest installer in Arizona went bankrupt. Later, the ACC rejected APS's DDSR Aggregation tariff filing.

Resources

Arizona Corporation Commission: Decision 77855
Arizona Public Service request for proposals (RFP)
APS's demand-side management programs
APS's residential battery pilot
Lawrence Berkeley National Laboratory expert review
Arizona Public Service's tariff discontinuation
Arizona Corporation Commission rejected Arizona Public Service's tariff

Presentation: Sandra Sweet, New York Department of Public Service

Summary

Sandra Sweet provided an overview of New York's 20-year journey from Net Energy Metering (NEM) enacted by state statute in 1997 to implementing the VDER Order passed in 2017. Their presentation outlined the details of the Value of Distributed Energy Resources (VDER) value stacks, providing a more granular look into the value streams available to different technologies and the values that customers could opt into/out of.

Key messages

Drivers for changing NEM
Several challenges in the initial NEM paradigm necessitated a new approach. A significant increase in residential solar led to a cost shift to non-NEM customers. NEM customers were not funding the public benefit programs, and there was poor alignment

with rate design principles and grid needs. Future iterations needed more equitable compensation frameworks and a gradual, customer-oriented transition.

Compensation and crediting types used in New York
New York uses two main types of compensation approaches for distributed generation customers. **Monetary crediting** translates kWh injections into the grid into a dollar value based on a kWh delivery rate and applies the value to the utility bill as a reduction in cost. **Volumetric crediting** calculates difference between the kWh that customers with distributed generation produce and the kWh they use; any net excess kWh become a direct kWh credit for the next month's bill. Under **VDER**, New York uses both volumetric and monetary approaches to compensate distributed generation projects depending on the technology and project size.

Value of Distributed Energy Resources (VDER) order overview
The NY DPS issued the first VDER Order in 2017, which implemented two phases of compensation through the utility tariffs: VDER Phase One NEM and VDER Value Stack. The VDER Phase One NEM is geared toward mass market customers and is a volumetric crediting compensation limited to 20 years once participation begins. VDER Value Stack is a monetary crediting system and is limited to 25 years once participation begins.

VDER value stack
The VDER value stack is complex. It is a combination of multiple value streams; **the locational based marginal price (LBMP)** which is based on the actual day-ahead NYISO hourly locational based marginal pricing in effect at the time of generation, grossed up for avoided distribution losses; **the capacity value**, which is one of three payment streams based on the NYISO installed capacity and it is different for non-dispatchable and dispatchable technologies; **the environmental value**, which has an opt-out option for customers who are interested in participating in the voluntary market including environmental and sustainability certification programs; and an **avoided distribution value**, which is comprised of a demand reduction value and a locational system relief value. Customers who meet eligibility and opt into the Value Stack Tariff on or before July 26, 2018 are compensated under VDER Value Stack Phase 1 and projects installed on or after July 27, 2018 are compensated under VDER Value Stack Phase 2 which modified applicable hours for the capacity value.

Wholesale Value Stack
The Wholesale Value Stack was implemented in July 2023 in response to FERC Order 2222. The Wholesale Value Stack allows compensation for all of the VDER Value Stack components, with the caveat that Wholesale Value Stack allows customers to opt in and sell energy and capacity in the wholesale market directly to the NYISO. Distributed energy resource systems that choose to export to the NYISO charge and discharge at wholesale rates. Customers participating in the wholesale market cannot double count or receive duplicate compensation from the retail market and wholesale market.

Coming up:
Utilities will be submitting wholesale distribution tariffs in the upcoming months.

Resources

Standardized Interconnection Requirements Addendum
New York State Utility Electric Tariffs
New York State Energy Research and Development Authority's Solar Value Stack Calculator

Plenary discussion

Key questions and discussion
The moderator posed questions based on the presentations with input from audience members. Panelists addressed the questions live. Summaries of the questions and responses are included below.

What business models are best suited to bring DER resources to scale?
One panelist proposed that the complexities of valuation and compensation are acting as a barrier to entry and are impeding the ability for resources to participate. They noted that it could be possible to make more relevant data accessible and see

natural market evolution, since existing procurement approaches might not be a sufficient pathway to scalability. In the near term, we need to focus on system design and the existing interactions to understand DER participation.

Another panelist offered that Request for Proposal (RFPs) can be effective for procuring ADER grid services, and there's nothing wrong with that approach. It can be slow, it's less nimble, but it might increase competition. However, the selection criteria matter; it's critical to fully understand the electric grid needs case, because the easiest to select vendor might not be the right fit. APS took this approach recently, and filed an all-source RFP. A winner will be announced in the next few weeks.

Discussion also covered whether the utility is sufficiently motivated to enable ADER participation at scale. This discussion noted that on the one hand, the load serving entity must support reliability at a reasonable cost, and therefore ADER grid service provision is clearly beneficial. However, on the other hand, the load serving entity's revenue requirement and profits increase with capital base under most regulatory models, which does not necessarily align with optimization of distribution system operation and investment. This discussion moved on to highlight the criticality of strong Public Utility Commissions able to lead change to support ADERs.

Can these ideas be incorporated into Integrated Distribution and System Planning (IDSP)?
Yes, and IDSP is absolutely needed. Non-wires alternatives and hosting capacity analyses are key enablers for ADER based grid services, and should explicitly be designed with this in mind.

Is it complex to have ISO and PUC overlaps?
In New York, compensation for energy and capacity are clearly outlined in the tariffs, reducing complexity. If ADERs are selling in wholesale markets, they will pay wholesale rates through NYISO.

Other notable remarks:

- Well-developed and robust stakeholder processes were instrumental in ensuring a good outcome in New York.
- There's a need to better understand grid modernization investment needs to inform the role DERs can play.
- One participant was interested in understanding how to encourage utilities to innovate and learn lessons on these topics too, opening a debate on the readiness of utilities to support and adopt ADER policies.